



(19)

Europäisches Patentamt
European Patent Office
Office européen des brevets

(11)

EP 0 913 605 A3

(12)

EUROPEAN PATENT APPLICATION

(88) Date of publication A3:
31.05.2000 Bulletin 2000/22

(51) Int. Cl.⁷:

F16J 15/32

(43) Date of publication A2:
06.05.1999 Bulletin 1999/18

(21) Application number: 98120255.9

(22) Date of filing: 26.10.1998

(84) Designated Contracting States:
AT BE CH CY DE DK ES FI FR GB GR IE IT LI LU
MC NL PT SE
Designated Extension States:
AL LT LV MK RO SI

(30) Priority: 24.10.1997 JP 30952297
21.10.1998 JP 31838898

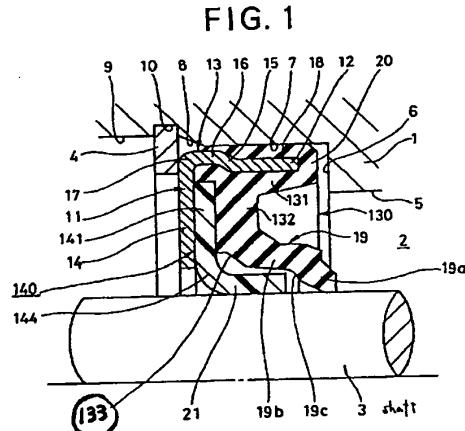
(71) Applicant: EAGLE INDUSTRY Co., Ltd.
Tokyo 105-8587 (JP)

(72) Inventors:
, Yamanaka, Satoshi
Nagaigawa Fukushima-shi, Fukushima-ken (JP)
, Ikeda, Yasuhiro
Souja-shi, Okayama-ken (JP)
, Munakata, Shinobu
Fukushima-shi, Fukushima-ken (JP)

(74) Representative:
Klunker . Schmitt-Nilson . Hirsch
Winzererstrasse 106
80797 München (DE)

(54) Sealing apparatus

(57) In the sealing apparatus of the invention, the engagement portion with the housing is sealed by a stationary sealing portion (18) made of rubber attached to the outer periphery of the cylindrical portion of the reinforcing ring (11); the sliding portion with the shaft is sealed by sealing lips and supported by the reinforcing ring (11); and the reinforcing ring (11) axially engages with the stop functional member (4) such as a stop ring (4) fixed to the inner periphery of the housing (1). In this sealing apparatus thus prevented from coming off, the reinforcing ring (11) is provided with an engagement area expanding section (13) which is arranged on the open-air side of the cylindrical portion (12), having a larger diameter than the cylindrical portion (12), arranged near the inner periphery of the housing (1), and expands the engagement area with the stop ring (4).



EP 0 913 605 A3

EP 0 913 605 A3

European Patent
Office

EUROPEAN SEARCH REPORT

Application Number
EP 98 12 0255

DOCUMENTS CONSIDERED TO BE RELEVANT			CLASSIFICATION OF THE APPLICATION (Int.Cl.6)
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	
X	DE 36 42 082 A (ZAHNRADFABRIK FRIEDRICHSHAFEN) 25 June 1987 (1987-06-25) * the whole document *	1-4, 7, 8	F16J15/32
A	WO 94 29622 A (NOK CORP ; MATSUSHIMA NOBORU (JP); YAMANAKA SATOSHI (JP)) 22 December 1994 (1994-12-22) * page 1; figure 1 *	1, 5	
A	US 4 834 397 A (SHIMASAKI KEIICHI ET AL) 30 May 1989 (1989-05-30) * column 13, line 33 - column 14, line 13; figure 8 *	1, 6	
A	GB 2 210 115 A (TAIHO KOGYO CO LTD) 1 June 1989 (1989-06-01) * page 3, line 7 - page 8, line 10; figures 1, 2 *	1, 6	
A	US 4 550 920 A (MATSUSHIMA NOBORU) 5 November 1985 (1985-11-05) * the whole document *	10, 11	
A	US 4 522 411 A (BURGAN THOMAS J) 11 June 1985 (1985-06-11) * page 1; figure 1 *	1	F16J
The present search report has been drawn up for all claims			
Place of search	Date of completion of the search	Examiner	
BERLIN	28 March 2000	Hoffmann, M	
CATEGORY OF CITED DOCUMENTS			
X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document			
T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document			

EP 0 913 605 A3
ANNEX TO THE EUROPEAN SEARCH REPORT
ON EUROPEAN PATENT APPLICATION NO.

EP 98 12 0255

This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report.
The members are as contained in the European Patent Office EDP file on
The European Patent Office is in no way liable for these particulars which are merely given for the purpose of information.

28-03-2000

Patent document cited in search report		Publication date		Patent family member(s)		Publication date
DE 3642082	A	25-06-1987		WO 8703946 A		02-07-1987
				EP 0289498 A		09-11-1988
				US 4861172 A		29-08-1989
WO 9429622	A	22-12-1994		NONE		
US 4834397	A	30-05-1989		NONE		
GB 2210115	A	01-06-1989		JP 2008565 A		12-01-1990
				JP 1030975 A		01-02-1989
				GB 2214576 A, B		06-09-1989
				US 5083802 A		28-01-1992
				US 4822059 A		18-04-1989
US 4550920	A	05-11-1985		NONE		
US 4522411	A	11-06-1985		NONE		